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09/658,696	09/08/2000	Sung Bae Moon	C34037/119442	3637

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EXAMINER

HAN, CLEMENCE S

ART UNIT PAPER NUMBER

2665

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/658,696

Applicant(s)

MOON, SUNG BAE

Examiner

Clemence Han

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10 and 12 is/are rejected.
- 7) ☒ Claim(s) 8, 11 and 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 3-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 3 recites the limitation "said plurality of digital modulators" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 4 recites the limitation "said plurality of digital modulators" in the second line of the claim. There is insufficient antecedent basis for this limitation in the claim.
5. Claim 5 recites the limitation "said plurality of digital modulators" in the third line of the claim. There is insufficient antecedent basis for this limitation in the claim.
6. Claim 5 recites the limitation "said D/A converter" in the last line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 1, 2, 6, 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xin et al. (U.S. Patent 6,268,818) in view of Boesel et al. (U.S. Patent 6,286,994).

In regarding to claim 1, Xin teaches an RF transmitting device 800 having a baseband signal on I/Q channels 801, 802 and a transmitting antenna, said RF transmitting device comprising: a digital unit for digital modulating the baseband signal on the I/Q channel (Column 11 Line 49 – 52), and then converting the digital modulated signal into an analog signal 814; an analog frequency up-converting unit for primarily up-converting 818 the analog-converted signal in the digital unit into an IF signal and a secondary up-converting 824 the converted IF signal into an RF signal; and a transmitting unit for amplifying the secondarily up-converted RF signal to an arbitrary transmitting output level and transmitting the amplified signal via the transmitting antenna (Column 11 Line 46 – 47). Xin, however, does not teach the plurality of channel cards in the RF transmitting

device of a mobile radio communication base station system in a CDMA system. Boesel teaches the use of the plurality of channel cards in the RF transmitting device of a mobile radio communication base station system in a CDMA system 710, 728. It would have been obvious to one skilled in the art to modify Xin to include a plurality of channel cards as taught by Boesel in order to use it in a CDMA system where multiple channels are supported (Column 6 Line 9 – 29).

In regarding to claim 2, Xin teaches a digital modulators for executing a QPSK modulation (Figure 8) and a D/A converter 814 for converting QPSK modulated signal into an analog signal to thereby output the converted analog signal to said analog frequency up-converting unit (Figure 8). Xin, however, does not teach the plurality of channel cards in a CDMA system. Boesel teaches the use of the plurality of channel cards in a CDMA system 710, 728. It would have been obvious to one skilled in the art to modify Xin to include a plurality of channel cards as taught by Boesel in order to use it in a CDMA system where multiple channels are supported (Column 6 Line 9 – 29).

In regarding to claim 6, Xin teaches the analog frequency up-converting unit comprises: a first frequency up-converter 818, 820 for up-converting the coupled multi-frequency assignment analog signal outputted from said digital unit into an arbitrary IF signal; a band-pass filter 822 for band-pass filtering the coupled multi-

frequency assignment IF signal outputted from said first frequency up-converter 818, 820 to an arbitrary frequency bandwidth; and a second frequency up-converter 824, 826 for converting the IF signal filtered in said band-pass filter 822 into an RF signal to thereby output the converted RF signal to said transmitting unit.

In regarding to claim 7, Xin teaches the first frequency up-converter comprises: a first local oscillator 820 for generating a fixed local frequency to convert the analog signal inputted into the IF signal; and a first mixer 818 for mixing the fixed local frequency signal generated from said first local oscillator and the analog signal inputted and converting the mixed result into the IF signal having a constant center frequency of the multi-frequency assignment band.

In regarding to claim 9, Xin teaches the second frequency up-converter comprises: a second local oscillator 826 for generating a fixed local frequency to convert the filtered IF signal inputted into the RF signal; and a second mixer 824 for mixing the fixed local frequency signal generated from said second local oscillator and the IF signal and converting the mixed result into the RF signal having a constant center frequency of the multi-frequency assignment band.

In regarding to claim 10, Xin teaches an RF transmitting device 800 having a baseband signal on I/Q channels 801, 802 and a transmitting antenna, said RF

transmitting device comprising: a digital modulators for performing a QPSK modulation (Column 11 Line 49 – 52 and Figure 8); a D/A converter 814 for converting the QPSK modulated signal into an analog signal and outputting the converted analog signal to an analog frequency up-converting unit (Figure 8); said analog frequency up-converting unit comprising a first frequency up-converter 818, 820 for converting the analog modulated signal outputted from said D/A converter into an arbitrary IF signal, a band-pass filter 822 for filtering the up-converted IF signal in said first frequency up-converter to an arbitrary bandwidth, and a second frequency up-converter 824, 826 for converting the filtered IF signal in said band-pass filter into an RF signal to thereby output the converted RF signal to a transmitting unit; and said transmitting unit for amplifying the up-converted RF signal in said second frequency up-converter of said analog frequency up-converting unit to an arbitrary transmitting output level and transmitting the amplified signal via said transmitting antenna (Column 11 Line 46 – 47). Xin, however, does not teach the plurality of channel cards in the RF transmitting device of a mobile radio communication base station system in a CDMA system. Boesel teaches the use of the plurality of channel cards in the RF transmitting device of a mobile radio communication base station system in a CDMA system 710, 728. It would have been obvious to one skilled in the art to modify Xin to

include a plurality of channel cards as taught by Boesel in order to use it in a CDMA system where multiple channels are supported (Column 6 Line 9 – 29).

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xin et al. in view of Boesel et al. and further in view of Chester et al. (U.S. Patent 5,930,301). Xin in view of Boesel teaches the digital modulators comprises: the digital signal processing blocks 804, 810; a digital local oscillator for outputting arbitrary local frequencies having the phase difference of 90 (Column 11 Line 21 and 28); a plurality of mixers 806, 812 for mixing each of the local frequencies having the phase of 0 and 90 generated from said local oscillator and each of the baseband signals on the I/Q channels; and an adder 808 for adding the mixed signals on the I and Q channels in said plurality of mixers. Xin in view of Boesel, however, does not teach explicitly that the digital signal processing blocks are comprised of low-pass filters and interpolation filters. Chester teaches the digital signal processing blocks comprised of low-pass filters 200 and interpolation filters 11. It would have been obvious to one skilled in the art to modify Xin in view of Boesel to include the low-pass filters and interpolation filters as taught by Chester in order to reduce distortion (Chester Column 1 Line 47 -49).

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xin et al. in view of Boesel et al. and Chester et al. as applied to claim 3 above and further in view of Antonio et al. (U.S. Patent 6,519,456). Xin in view of Boesel and Chester teaches the use of local oscillator. Xin in view of Boesel and Chester, however, does not teach exact value of the frequency intervals. Antonio teaches that 1.25 MHz is the preferred channel bandwidth in CDMA (Column 5 Line 25 – 28). It would have been obvious to one skilled in the art to use 1.25 MHz in Xin in view of Boesel and Chester as taught by Antonio in order to comply with CDMA standard (Column 1 Line 60 –62).

11. Claim 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xin et al. in view of Boesel et al. and further in view of Antonio et al..

In regarding to claim 5, Xin in view of Boesel teaches the digitally modulated signal outputted to the D/A converter 814. Xin in view of Boesel, however, does not teach the outputs of the modulators serially coupled. Antonio teaches the serially coupled outputs from the modulators outputted to the D/A converter (Figure 13). It would have been obvious to one skilled in the art to serially couple the outputs from the Xin in view of Boesel's modulators as taught by Antonio in order to generate a composite baseband signal (Column 19 Line 33).

In regarding to claim 12, Xin in view of Boesel teaches an RF transmitting device 800 of a mobile radio communication base station system in a CDMA system having a plurality of channel cards providing baseband signals on I/Q channels 801, 802 for multi-frequency assignment and a transmitting antenna, said RF transmitting device comprising: a plurality of digital modulators by frequency assignment for executing a QPSK modulation for each of the CDMA baseband signals outputted by said plurality of channel cards to thereby output a digital modulated signal in a multi-frequency assignment band (Column 11 Line 49 – 52 and Figure 8); a D/A converter 814 for converting the coupled multi-frequency assignment QPSK modulated signal into an analog signal to thereby output the converted analog signal to an analog frequency up-converting unit (Figure 8); said analog frequency up-converting unit comprising a first frequency up-converter 818, 820 for up-converting the coupled multi-frequency assignment analog signal outputted from said D/A converter into an arbitrary IF signal, a band-pass filter 822 for band-pass filtering the coupled multi-frequency assignment IF signal outputted from said first frequency up-converter to an arbitrary bandwidth, and a second frequency up-converter 824, 826 for converting the multi-frequency assignment IF signal filtered in said band-pass filter into an RF signal to thereby output the converted RF signal to a transmitting unit; and said transmitting unit for

amplifying the up-converted RF signal in said second frequency up-converter of said analog frequency up-converting unit to an arbitrary transmitting output level and transmitting the amplified signal via said transmitting antenna (Column 11 Line 46 – 47). Xin in view of Boesel, however, does not teach the outputs of the modulators serially coupled. Antonio teaches the serially coupled outputs from the modulators outputted to the D/A converter (Figure 13). It would have been obvious to one skilled in the art to serially couple the outputs from the Xin in view of Boesel's modulators as taught by Antonio in order to generate a composite baseband signal (Column 19 Line 33).

Allowable Subject Matter

12. Claim 8, 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(The examiner noticed that the specific value of 3.75MHz comes from the facts that there are three channels (application Figure 3) and each channel has bandwidth of 1.25MHz (claim 4). However, none of objected claims has the limitations on both the number of channels and channel bandwidth.)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to the RF transmitter.

U.S. Patent 6,052,378 to Park

U.S. Patent 6,208,844 to Abdelgany

U.S. Patent 6,216,004 to Tiedemann, Jr. et al.

U.S. Patent 6,292,652 to Kim

U.S. Patent 6,370,109 to Schwartz et al.

U.S. Patent 6,430,169 to Harms et al.

U.S. Patent 6,473,133 to Twitchell et al.

U.S. Patent 6,473,416 to Lee


U.S. Pub. 2003/0214926 to Choi et al.


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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clemence Han whose telephone number is (703) 305-0372. The examiner can normally be reached on Monday-Friday 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.


Clemence Han
Examiner
Art Unit 2665


HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600